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DR. LUDWIG DIELS, of Marburg, has been appointed associate professor of botany in the University of Berlin, and assistant director of the Botanical Garden and Museum.

#### DISCUSSION AND CORRESPONDENCE

##### FOSSIL PLANTS IN THE PANAMA CANAL ZONE

EXCEPT for the incidental mention by Pilsbry and Brown of lignified nuts in their paper on the Mollusca I know of no record of any remains of fossil plants having been found in the Canal Zone, notwithstanding the fact that the numerous Tertiary tuffs would seem to furnish an admirable matrix for the preservation of leaf impressions.

During 1912 Dr. M. I. Goldman, of the Johns Hopkins University, visited the Isthmus and in connection with his work on rock weathering devoted considerable time to a search for fossil plants along the Canal with the results indicated by the following note.

Since fossil plants of Tertiary age from the tropics have not been collected or studied to any large extent and since the Tertiary floras of Central America have a most important bearing on both the phytologic and geologic history of southeastern North America during the Tertiary, a preliminary announcement seems justifiable.

Fossil plants seem to be somewhat sparsely but widely distributed along the canal and identifiable forms were collected from the following localities:

1. East wall of the Culebra Cut just north of station 1760 and opposite Culebra.
2. West wall of cut below Miraflores locks, where the plant-bearing tuff outcrops for about one fourth of a mile.
3. Culebra Cut under the steep hill just north of Paraiso, associated with specimens of the pelecypodian genus *Phacoides*.
4. Gatun Dam borrow pits.

The best material comes from the first of these localities and the least satisfactory from the last. The collections have not been critically studied, since it is hoped that more extensive collections will be sent in by the resident geologist of the Canal Commission.

The following forms have been recognized

in a preliminary study of the collection: A fine large species of *Guatteria* which is present at several localities; a well-marked species of *Myrtaceæ*, probably representing the genus *Calypttranthes*; a species of *Nectandra*; a species of *Rhamnaceæ*; a characteristic small-leaved species of *Ficus*; another of *Ocotea*; a species of *Rubiaceæ* and one of *Melastomaceæ*. Petrified wood was also collected and although but three slides have been cut these show apparent identity with a species described from the Oligocene of the Island of Antigua.

None of the material lends any support to the view, at one time prevalent, that some of the Isthmian beds represent deposits of Eocene age, and while the various plant-bearing beds are probably not exactly synchronous, their floras in so far as they are known from the present small collection all appear to be referable to the Oligocene.

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##### WHAT GRADES REPRESENT

THE following considerations have been of service to the writer in the diagnosis of the difficulties encountered by students in meeting the scholastic requirements represented by grades, and the identifying of the obstacles has often assisted in their removal.

It is not necessary in this discussion to assume any more definite or uniform system of grading than that 100 per cent. represents a perfect grade and that there is a minimum grade required to entitle the student to credit for the course. Half way between these is what may be called an average grade. This does not mean the grade that a class would average under the usual conditions, but what a class might be expected to average if all members gave all the officially allotted time (or a reasonable time) and their best effort to the subject—quite a different matter! The instructor should make his demands such that the student of average qualifications using his best effort all the allotted time would receive the average grade—half way between the passing grade and 100 per cent.

The main factors represented by grades intelligently given may be described by the six terms: time, effort, mental ability, memory, language sense and preparation. The relative importance of these factors varies widely with the nature of the subject, but all are involved in every intellectual pursuit. The order chosen is that of directness of control by the student.

*Time.*—This includes both that in attendance on classes and that given to the subject outside of class hours. Irregularity of attendance on classes and deficiency of outside preparation would have their obvious results in this factor, irrespective of the reasons for such irregularity or deficiency.

*Effort.*—This factor includes the practise of concentration in and out of class, largely a result of past habits; thoroughness of thought, which passes nothing until really grasped; and system, which insures sustained and continuous work as opposed to cramming at intervals.

*Mental Ability.*—This is evidenced by the ease and accuracy with which new ideas are grasped. It is of course largely a natural endowment, developed, however, or allowed to deteriorate, slowly by its exercise or its disuse. This factor is most important in subjects of a strongly reasoning character.

*Memory.*—By this term is meant the retaining of ideas rather than the memorizing of words or symbols; it is mainly a natural endowment but somewhat subject to cultivation by mental activity.

*Language Sense.*—By this is meant the ability to understand and to use language with precision. It is probably to some degree a natural gift, but is also largely a result of early training and associations and an appreciation of its importance. The student who can not express his own ideas clearly usually receives only vague impressions from his oral or printed instruction. The language sense can be cultivated by sustained effort directed to that end.

*Preparation.*—This includes general education along intellectual lines, to which appeal can be made for analogies and illustrations. It also means a proper command of the earlier part of the same subject and of other subjects

directly used as foundational material and as tools; grades wisely given in these antecedent subjects indicate clearly the adequacy of this direct preparation. It is in this factor that the student who has habitually aimed at passing rather than grasping his curriculum encounters the natural consequences in his increasing difficulties.

In conclusion it may be noted that time and effort are under immediate control; mental ability, memory and language sense are subject to slow cultivation; and preparation is beyond present control. Of course less than all the allotted time, or less than the student's best effort, or less than an average rating in factors, would necessitate correspondingly higher values for the other factors that an average grade might be earned.

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#### SCIENTIFIC BOOKS

*Elementary Studies in Botany.* By JOHN M. COULTER, A.M., Ph.D., Head of the Department of Botany, University of Chicago. New York and Chicago: D. Appleton and Company. 12mo. Pp. ix + 461.

It is a pleasure to note the gradual approach to a standard course of study in botany for the high schools of the country, and there can be no question that such an approach to standardization is occurring if one will look over the text-books prepared during the last few years. Especially is this tendency marked where the authors combine a considerable experience in the teaching of botany with a comprehensive knowledge of the science. The book before us is an excellent illustration of this fact, which the author recognizes in the opening paragraph of his preface, and which is so good that we quote it complete. "It is seven years since 'A Text-book of Botany' was published, and during this period there has been not only great progress in the knowledge of plants, but also much discussion concerning the effective use of plants in high school education. It is natural that a discussion of this kind should lead to considerable